

# CAAP Quarterly Report

Date of Report: *December 29, 2016*

Contract Number: *DTPH5616HCAP02*

Prepared for: *U.S. Department of Transportation/Pipeline and Hazardous Materials Safety Administration (USDOT-PHMSA)*

Project Title: *Glass-Polymer Composite High Pressure Pipes and Joints Design, Manufacture & Characterize*

Prepared by: *West Virginia University, Constructed Facilities Center (WVU-CFC)*

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For quarterly period ending: *December 31, 2016*

## **Business and Activity Section**

### **1. Generated Commitments**

#### *1.1 Agreement Changes*

There has been no change in project participants or other contracts details during the last quarter.

#### *1.2 Phase 2 Kickoff Meeting*

A kickoff meeting for Phase 2 of the project took place November 22, 2016. The meeting was attended by Zaid Obeidi from USDOT-PHMSA, Dean Eugen Cilento, Dr. Udaya Halabe, Dr. Hota GangaRao, Dr. John Zondlo, Engineering Scientist Mark Skidmore, and several other professors and graduate students from West Virginia University.

#### *1.3 Purchases*

Some supplies have been purchased during this reporting period. The purchased supply items are listed in Table 1. The supplies were ordered for a preliminary 6" diameter Glass Fiber Reinforced Polymer (GFRP) composite pipe burst test which is scheduled to take place in early January of 2017. The design drawings for the 6" diameter pipe testing were supplied to Wilson Works, Morgantown, WV in early December 2016 and additional test fixture drawings for 12" diameter pipe were supplied to Wilson Works in late December, 2016.

*Table 1: Supplies purchased*

No.	Item Description	Quantity
1	1.25" 150ksi Williams Threaded bar	8
2	End nuts and washers	16
3	Couplers	8
4	O-Rings	4
5	Back Up Rings	8
6	Pressure Transducer	1

## **2. Graduate Students Working on the Project**

M.S.C.E. Student – 1

**Note:** All student(s) have part-time appointments on research project.

## **3. Status Update of Past Quarter Activities**

The following project planning and research activities have been completed during the last quarter (October 1 – December 31, 2016).

### *3.1 Procurement of Materials*

The materials which have been procured at this point are to be manufactured into a test rig which will serve as endcaps for a 6" diameter GFRP pipe 30,000 psi burst test.

### *3.2 Test Rig Design*

In tandem with the procuring of materials, the test rig for the burst test was designed. Design, manufacturing, and testing have been and will continue to be done with the assistance of Wilson Works, a local fabrication and testing company.

### *3.3 Literature Review/Pressure Vessel Design*

In addition to the work on the preliminary test, research has been underway so that a proper understanding of GFRP pipe mechanics can be developed. This research will be relevant in the next few months as pipe burst test results become available.

## **4. Description of any Problems/Challenges**

A major challenge has related to the burst test methodology. Pipes under burst pressures of 30,000 psi create very large resultant forces on the endcaps. As such, a test rig capable of sustaining these loads had to be designed so that the tests can be performed safely.

## **5. Planned Activities for the Next Quarter**

The following activities are planned for the next quarter:

1. Burst tests of several (6", 8", 10", 12") GFRP Pipes
2. Failure analysis and modeling
3. Development of GFRP pipelines design.